

Physics 122: Fundamentals of Physics II

Spring 2011 — Lecturer: Pat Harding

Check class Blackboard website for latest information: www.elms.umd.edu

Overview

The purpose of this class is to give you a deep understanding of the fundamental principles that govern physical systems, how they may be used to accurately predict the behavior of objects when they interact with their environment, and how these simple principles lead to more complex phenomena. Topics will include harmonic motion, waves, superposition, light rays, mirrors, refraction and reflection of light, lenses, interference of light, electric and magnetic forces, electric and magnetic fields, electric energy, voltage, and basic circuits.

Lectures will be given on Tuesdays and Thursdays from 12:30–1:45 in room 1410 in the Physics lecture halls wing. These sessions will actually be fairly interactive—please come ready to think and respond, not just to take notes!

You will also have a one-hour **discussion session** and a two-hour **lab session** each week, with a few exceptions: you'll have no discussion session or lab in the first week of the semester or the week of Spring Break. The discussion session, which meets in room 3301, is structured in a “tutorial” manner to help you explore and solidify physics principles and their consequences, collaborating with your classmates and TA. The lab sessions, in room 3312, present you with rather open-ended investigations that you must plan, carry out, evaluate and explain in teams—there is no “cookbook” for them! You must attend the specific discussion and lab sessions for the course section you registered for. If you miss your normal day for a valid reason (such as illness), you might be able to attend a later discussion session that week; be sure to check with me first. At the end of the semester there will be time available to make up one lab session if you missed one for a valid reason during the semester.

Required and optional materials

The textbook for this course is “College Physics: A Strategic Approach” by Knight, Jones and Field, published by Addison-Wesley / Pearson. PHYS 122 will cover material corresponding to chapters 14-28. The current edition of the book is the second edition, but the first edition is very similar and is an acceptable substitute that you could obtain used; however, before you run out and buy a used copy, carefully read below about bundled items which affect the economics of buying a new versus a used book: New copies of the textbook are available in a number of packages, bundled with various add-ons, with different ISBN numbers. The most important add-on for this course is MasteringPhysics, a web-based homework system that is a required part of this course. For those who took Physics 121 last semester, your MasteringPhysics account should still be valid. When MasteringPhysics access is purchased with a book, it is valid for two

years and includes an “eText” version of the book that you can read online if you don’t have your book with you. MasteringPhysics access can also be purchased separately at masteringphysics.com for \$54 for a two-year subscription, though that does not include the eText. So that \$54 would be an additional cost if you buy a used copy of Knight/Jones/Field that does not include an unused MasteringPhysics access code. A workbook and study guide are available for purchase packaged with the text. The workbook and study guide are not required for this course, but some students may find them helpful.

In addition to the textbook, you will need a copy of the “Physics 122 Tutorials and Laboratories” manual, which is a U. of Maryland custom book published by Wiley with ISBN 978-0-4-7056674-9.

Finally, for this course you will need to have a “clicker”, or else a web-enabled phone (or other device) with a ResponseWare license that you can use in place of a clicker. My ResponseWare session ID is JPHARDING . You will also need to register your clicker (or other device) at <http://my.umd.edu> so that it is associated with your student ID. For details and purchasing information, go to <http://clickers.umd.edu/> and click on the “Students” tab. The “RF-LCD” model is currently preferred, though the older RF and XR models will also work if you already own one.

To summarize: the required materials for PHYS 122 are the textbook; MasteringPhysics access; the tutorials/labs manual; and a clicker or suitable alternative.

MasteringPhysics registration and enrollment

The regular textbook bundle includes a slim cardboard “Student Access Kit” with an activation code for MasteringPhysics. Alternatively, you can purchase a MasteringPhysics subscription separately at www.masteringphysics.com. Important: If you purchase a subscription online, be sure to specify the standard textbook for the course: Knight/Jones/Field, College Physics, 2nd edition (even if you are using a printed copy of the 1st edition book); otherwise the MasteringPhysics registration system will not let you enroll in our course. Once you have registered, you can log in and “join” our specific course. Enter your Student ID (the 9-digit number on the front of your University ID card, beginning with either “10” or “11”) and the Course ID: MPHARDING89109 .

How assignments will be graded

MasteringPhysics automatically calculates grades based on your answers (except for free response answers), but the rules for giving partial credit can be confusing. Here is how I plan to set up the grading:

- You get a maximum of five attempts to answer each part. For symbolic or numeric questions, each wrong answer before the correct one reduces your score on that part by 10%. For multiple-choice questions, each wrong answer before

the correct one reduces your score by the fraction $1/(n-1)$, where n is the number of answer choices.

- There is no penalty for opening a hint. However, if you answer the part correctly without opening a hint, you get a bonus of 10% per unopened hint. (You can even look at the list of hint topics without actually opening any of them.)
- If you open a hint that contains a question, and you answer that question incorrectly, then your score is reduced by 10%. There is no penalty for leaving a hint question unanswered.

If you think you have lost points unfairly for some technical reason, let me know what happened and I will look at your answers and make an adjustment if appropriate.

Graded work

MasteringPhysics homework will be assigned each week and due at **noon on Monday**. A **quiz** will be given each **Thursday** at the end of lecture. **Lab work** will also be graded, and you will earn points for **participation** in class (by responding to clicker questions, etc.) One **midterm** exam will be given in class, plus a **final** exam at the end of the semester.

Participation points will come from the use of clickers throughout the lecture. There will be several clicker questions asked during each lecture, and students will receive credit for answering at least half of the questions in a given lecture.

The **MasteringPhysics** homework will consist of 2 types of problems - tutorial-type problems and end-of-chapter problems. Tutorial-type problems are designed to build understanding of the new topic through walking the student through several steps. End-of-chapter problem are more computational and demonstrate the student's ability to solve problems about a given topic.

The in-class **quizzes** will last 15-20 minutes and contain 3 questions. Each quiz will contain one question involving mathematical calculation, one conceptual question, and one question involving estimation. These quizzes are designed to show the student's familiarity with the topic of the previous homework assignment.

The in-class **exams** (one midterm and one final) will test the student's retention of physics concepts through the semester. Each exam will contain approximately ten questions, which may be based on anything from the lecture, quizzes, or homework.

Course grade:

10%	Participation
20%	MasteringPhysics Homework
25%	Labs and Tutorials
15%	Quizzes
30%	Exams (15% each)

Getting help

The **Course Center** (room 0208 in the physics building) is a dedicated space for you to meet and work on physics problems, especially in groups. There are tables and whiteboards, as well as a variety of texts. It is open for many hours each week, staffed by the TAs and lecturers from all sections of PHYS 122; the exact schedule will be posted on the course web site. Feel free to come by any time for help, though it may be best if you can come when I or one of the TAs working with our class is there

The **Slawsky Physics Clinic** (room 1214) is staffed by volunteers who are retired physicists. It is open Monday through Friday from 10AM to 3PM. Additionally, there is a room for Physics 122 open on MWF from 10-11AM & 2-3PM and TuTh from 12-1PM & 2-3PM.

Course policies

Late or missed work:

Assignments must be completed and turned in when they are due unless you have a valid excuse (e.g. illness) following university policy, in which case an extension will be granted. Please let me know your situation as soon as possible, and I will tell you if I need documentation for the reason for your absence. Otherwise, no credit will be given for work turned in late. Exams must be taken at the scheduled time unless you have a valid excuse, and documentation *will* be required. If you do miss an exam, I will schedule a make-up time with you (with a different set of questions).

Policy on collaborating:

Working together with other students is part of the course; in fact, the tutorials and labs are specifically designed around teamwork. Working together on the homework is also encouraged, but you must turn in your own work. This simple rule applies: **Never look at someone else's written solution.** Talking about how to work the problem is fine if it helps you to understand it better, but direct copying is strictly forbidden.

Honor Code:

The University of Maryland has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council. This Code sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student you are responsible for upholding these standards for this course. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism. For more information on the Code of Academic Integrity or the Student Honor Council, please visit <http://www.studenthonorcouncil.umd.edu/whatis.html> .

Religious observances:

If you need to miss class, a homework deadline, or an exam due to a religious observance, please notify me in advance—preferably at the beginning of the semester.

Students with disabilities:

Accommodations will be provided to enable students with disabilities to participate fully in the course. Please discuss any needs with me at the beginning of the semester so that appropriate arrangements can be made.

Weather and emergency closures:

If the University is closed due to weather or some emergency situation on the scheduled date of a quiz or exam, then the quiz or exam will be given during the next class period when the University is open. If the University is closed on any non-exam day, including just before an exam, then the exam will still be given according to the original schedule. In these or other exceptional circumstances, I will attempt to send out information by email.

Contact information

Lecturer

Pat Harding, room 4208 in the Toll Physics Building, 301-405-6073, hard0923@umd.edu
Office hours: TBA, or by appointment.

Lab and Tutorial

Prof. Eun-Suk Seo, Rm 3203 in the CSS building, 301-405-4855, seo@umd.edu

TAs:

Section	Tut+Lab Time	TA	Email	Office
0201	Tues 9:00-11:50	Lora McMurtrie	lorajm@umd.edu	Toll 3103B
0202	Wed 3:00-5:50	Matt Severson	mseverso@umd.edu	Toll 0104
0203	Mon 3:00-5:50	Lora McMurtrie	lorajm@umd.edu	Toll 3103B
0204	Wed 8:00-10:50	Matt Severson	mseverso@umd.edu	Toll 0104
0205	Thurs 3:00-5:50	Will Stem	wstem@umd.edu	Toll 0220

DISCLAIMER: The instructor reserves the right to make minor changes to this syllabus to meet the specific needs of the class during the semester.